

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the above-referenced application.

Listing of Claims:

1. (Currently amended) A current-drive apparatus for a display panel, comprising:

a plurality of current-drive circuits, ~~connected in cascade and configured so that~~
each of said plurality of current-drive circuits ~~comprises a reference current generation~~
~~section~~ including a reference resistor and a reference current generation circuit
responding to a voltage generated based on the reference resistor to produce at least one
internal reference current ~~operating so that a reference current generated from outside~~
~~said plurality of current-drive circuits is allowed to flow through said reference resistor~~
~~and at least one internal reference current is generated in response to flow of said at least~~
~~one internal reference current; and~~

a reference current source, said current source and said plurality of current-drive
circuits being connected such that a current flowing through said current source becomes
substantially equal to a current flowing through said reference resistor of each of said
current-drive circuits, and wherein a current flowing through said reference resistor in a
first one of said current-drive circuits flows through said reference resistor in a second
one of said current-drive circuits. ~~allowing said external reference current to flow through~~
~~said plurality of current-drive circuits, said current-drive circuit being operable to sum up~~
~~said at least one internal reference current in a desired number and output a desired~~
~~number of internal reference currents to a display element of said display panel.~~

2. (Currently amended) The current-drive apparatus according to claim 1, wherein at least one of said ~~reference current generation section~~ plurality of current-drive circuits further ~~comprises~~ includes at least one current adjustment resistor and operates so that a reference voltage generated across said reference resistor is applied across ~~each of~~ said ~~plurality of~~ at least one current adjustment ~~resistors~~ resistor to generate said at least one internal reference current.
3. (Currently amended) The current-drive apparatus according to claim 1, wherein said reference resistor of said ~~a~~ current-drive circuit chosen out of said plurality of current-drive circuits and located on the side of a high voltage supply is connected to said high voltage supply through a voltage adjustment resistor and said reference resistor of said ~~a~~ current-drive circuit chosen out of said plurality of current-drive circuits and located on the side of a low voltage supply is connected to said ~~reference~~ current source.
4. (Original) The current-drive apparatus according to claim 1, wherein each of said plurality of current-drive circuits comprises a voltage adjustment circuit connected to a terminal of said reference resistor on the side of a high voltage supply and wherein said plurality of current-drive circuits are configured so that when said plurality of current-drive circuits are biased, only said voltage adjustment circuit of said current-drive circuit chosen out of said plurality of current-drive circuits and located nearest to said high voltage supply has a voltage drop and the remainder of said plurality of current-drive circuits is short circuited.

5. (Original) The current-drive apparatus according to claim 4, wherein said voltage adjustment circuit comprises a high voltage terminal, a low voltage terminal, a step-down resistor connected between said high voltage terminal and low voltage terminal, and first and second MOS transistors having conduction types different from each other and connected in parallel with said step-down resistor, wherein said plurality of current-drive circuits are configured so that when said plurality of current-drive circuits are biased, only said step-down resistor of said current adjustment circuit of said current-drive circuit chosen out of said plurality of current-drive circuits and located nearest to said high voltage supply has a voltage drop and said current adjustment circuit of the remainder of said plurality of current-drive circuits becomes short circuited by turning on of at least one of said first and second MOS transistors.
6. (Currently amended) The current-drive apparatus according to claim ~~[[1]]~~ 2, wherein at least one of said ~~reference current generation section~~ plurality of current-drive circuits ~~comprises~~ further includes a first operational amplifier, provided as a voltage follower, for outputting a voltage appearing at a terminal of said reference resistor on the side of a high voltage supply and a plurality of second operational amplifiers, provided as a voltage follower, for outputting a voltage appearing at a terminal of said reference resistor on the side of a low voltage supply, and wherein ~~said reference current generation section~~ said at least one of said plurality of current-drive circuits is configured so that an output of said first operational amplifier and an output of each of said plurality of second amplifiers are applied to both ends of each of said at least one current adjustment resistor to generate corresponding one of said at least one internal reference current.

7. (Currently amended) The current-drive apparatus according to claim 6, wherein said ~~reference current generation section further comprises~~ at least one of said plurality of current-drive circuits further includes a reference current part disposed between each of said ~~plurality of current adjustment resistors~~ resistor and said low voltage supply, and is configured so that an output of corresponding one of said plurality of second operational amplifiers is input to said reference current part in order to allow said corresponding one of said at least one internal reference current to flow to said low voltage supply.
8. (Currently amended) The current-drive apparatus according to claim 1, wherein each of said plurality of current-drive circuits further comprises at least one current-drive section, wherein each of said at least one current-drive section mirrors corresponding one of said at least one internal reference current to generate a plurality of mirror currents and sums up a desired number of mirror currents out of said plurality of mirror currents in order to output sum of said desired number of mirror currents.
9. (Original) The current-drive apparatus according to claim 8, wherein each of said at least one current-drive section further comprises a plurality of switches corresponding to said plurality of mirror currents and operates so that said plurality of switches are selectively turned on to allow said sum up of said desired number of mirror currents.

10. (Original) The current-drive apparatus according to claim 8, wherein each of said at least one current-drive section further comprises a plurality of switches corresponding to said plurality of mirror currents and operates so that said plurality of switches are selectively turned on to allow said sum up of said desired number of mirror currents and wherein each of said plurality of current-drive circuits operates to sum up at least one set of said desired number of mirror currents and outputs sum of said at least one set of said desired number of mirror currents to said display element, thereby determining brightness of light emitted by said display element.
11. (Original) The current-drive apparatus according to claim 6, wherein a set of three sub-resistors is provided as each of said at least one current adjustment resistor so as to correspond to three primary colors and a switch circuit for selecting one of three primary colors is provided between said set of three sub-resistors and said first operational amplifier.
12. (Original) The current-drive apparatus according to claim 11, wherein said switch circuit comprises a first switch group provided between said three sub-resistors and an output of said first operational amplifier and a second switch group provided between said three sub-resistors and said non-inverting terminal of said first operational amplifier.

13. (Currently amended) A current-drive circuit for a display panel, comprising:

a reference current generation section including a reference resistor and operating so that a reference current generated from outside of said current-drive circuit is allowed to flow through said reference resistor and at least one internal reference current is generated ~~in response to flow of said reference current~~ according to a voltage across said reference resistor~~[[,]]-said current-drive circuit being operable to sum up said at least one internal reference current in a desired number and output a desired number of internal reference currents.~~

14. (Original) The current-drive circuit according to claim 13, wherein said reference current generation section further comprises at least one current adjustment resistor and operates so that a reference voltage generated across said reference resistor is applied across each of said at least one current adjustment resistor to generate said at least one internal reference current.

15. (Original) The current-drive circuit according to claim 14, wherein said reference current generation section comprises a first operational amplifier, provided as a voltage follower, for outputting a voltage appearing at a terminal of said reference resistor on the side of a high voltage supply and a plurality of second operational amplifiers, provided as a voltage follower, for outputting a voltage appearing at a terminal of said reference resistor on the side of a low voltage supply, and wherein said reference current generation section operates so that an output of said first operational amplifier and an output of each of said plurality of second amplifiers are applied to both ends of each of said at least one current adjustment resistor to generate corresponding one of said at least one internal reference current.
16. (Original) The current-drive circuit according to claim 15, wherein said reference current generation section further comprises a reference current part disposed between each of said at least one current adjustment resistor and said low voltage supply, and operates so that an output of corresponding one of said plurality of second operational amplifiers is input to said reference current part in order to allow corresponding one of said at least one internal reference current to flow to said low voltage supply.
17. (Original) The current-drive circuit according to claim 13, further comprising at least one current-drive section, wherein each of said at least one current-drive section mirrors corresponding one of said at least one internal reference current to generate a plurality of mirror currents and sums up a desired number of mirror currents out of said plurality of mirror currents in order to output sum of said desired number of mirror currents.

18. (Original) The current-drive circuit according to claim 17, wherein each of said at least one current-drive section further comprises a plurality of switches corresponding to said plurality of mirror currents and operates so that said plurality of switches are selectively turned on to allow said sum up of said desired number of mirror currents.
19. (Original) The current-drive circuit according to claim 18, wherein said reference current generation section further comprises at least one current adjustment resistor and operates so that a reference voltage generated across said reference resistor is applied across each of said at least one current adjustment resistor to generate said at least one internal reference current and wherein each of said at least one current-drive section operates so that said plurality of switches are selectively turned on to allow said current-drive circuit to output sum of at least one set of said desired number of mirror currents.
20. (Original) The current-drive circuit according to claim 15, wherein a set of three sub-resistors is provided as each of said at least one current adjustment resistor so as to correspond to three primary colors and a switch circuit for selecting one of three primary colors is provided between said set of three sub-resistors and said first operational amplifier.

Claims 21 -24 (Cancelled)

25. (New) A current-drive system for a display panel, comprising:

first and second power source lines;

a plurality of current-drive ICs, each of said plurality of current-drive ICs having first and second terminals and having a first resistor connected between said first and second terminals; and

a current source connected to said plurality of current-drive ICs so that said ICs and said current source are connected in cascade with said first and second terminals between first and second power source lines.

26. (New) The system as claimed in claims 25, wherein at least one of said plurality of current-drive ICs produces an internal reference voltage based on a voltage generated across said first resistor.

27. (New) The system as claimed in claims 25, wherein at least one of said plurality of current-drive ICs further includes a second resistor having a first end coupled to one end of said first resistor and having a second end coupled to the other end of said first resistor.

28. (New) The system as claimed in claims 25, wherein at least one of said plurality of current-drive ICs further includes:

a first OP amplifier having an input coupled to a node between said first terminal and said first resistor and an output thereof;

a second OP amplifier having an input coupled to a node between said second terminal and said first resistor and an output thereof; and

a second resistor coupled between the outputs of said first and second OP amplifiers.

29. (New) A current-drive apparatus according to claim 1, wherein said current-drive circuit is operable to sum up at least one internal reference current in a desired number and output a desired number of internal reference currents to a display element of said display panel.

30. (New) A current drive circuit according to claim 13, wherein said current-drive circuit is operable to sum up said at least one internal reference current in a desired number and output a desired number of internal reference currents.